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The Regular Monthly Meeting is held on the first Friday of every month, at 8 P. M.

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WILLIAM RUPP, 97 Water St., New York.

The Committee on Papers and Publications respectfully call attention to the resolutions of the Society, requiring that papers be submitted to the Committee before being read.

Authors will be furnished, gratis, with 20 reprints of each article published in the Journal, if application for the same be made when the article is sent.

Members are requested to give notice of any change of address, or failure in the delivery of the Journal. All communications relating to the Journal should be addressed to the Editor.

A. A. BRENEMAN, 97 Water St., New York.

REGULAR MEETING, November 2d. 1888.

Vice-President Breneman in the Chair.

The minutes of the meeting of Oct. 4th were read and approved.

Minutes of meeting of Board of Directors held Oct. 4th were read.

Messrs. E. Dwight Kendall, 58 Bainbridge street, Brooklyn, and H. P. Curtis, Zylonite Works, Zylonite, Mass., were unanimously elected members.

The following were proposed for membership:

CHAS. T. POMEROY, 226 Halsey Street, Newark, N. J.

Prof. ROBERT W. HALL, University Building, N. Y.

The following papers were then read by Dr. L. H. Friedburg, published in the October number:

"On a New Fat Extractor."

"On Curtius Hydrazin."

The Committee on Nominations presented a ticket for the annual election at the December meeting.

The meeting was then adjourned.

T. D. O'CONNOR,

Recording Secretary.

FATAL POISONING BY CARBON MONOXIDE.

By Prof. W. P. Mason.

In Troy, N. Y., on January 6, 1887, owing to a break in the street mains, a quantity of "Fuel Gas" (see analysis below), passed beneath the frozen crust of earth, and found its way into the adjoining houses. Three deaths, and many more or less serious illnesses, resulted.

The following points, from the testimony of the physicians who made the autopsis are to be noted :

The expressions of the deceased were placid. One victim, an old woman, was found seated in a chair holding her false teeth in her hand. The second, also a woman, lay upon the floor. The third, a man, sat upright on a lounge, his head reclining on his shoulder. The fire was burning in the stove, and the lamps were still burning on the table. When found, death had not been very recent, as "*rigor mortis*" was fully developed.

Very searching autopsis were made, with the result of finding nothing whatever abnormal, with the exception of the bright cherry-red color of the tissues, and the vivid redness and lack of coagula in the blood.

Upon opening the chest cavity the physician bent forward and took one or two long whiffs for the purpose of determing the presence of any odor. Almost immediately he was seized with giddiness and great oppression in the epigastrium, so much so that he had to discontinue his work for half an hour. The effects did not finally wear off until after an interval of about twelve hours.

The painful oppression in the chest, the giddiness and the subsequent headache experienced by this physician, call most forcibly to mind the symptoms described by Sir Humphry Davy, when he so rashly experimented upon himself with carbon monoxide.

A lawsuit naturally growing out of these cases of poisoning, I was called upon to give the chemical constituents found in the said

"Fuel Gas," and the results are appended. I also experimented upon animal life with carbon monoxide mixed with air, obtaining results confirmatory of observations already made, that death usually takes place very quietly, although occasionally with convulsive movements. Chickens and rats were the two forms of life employed.

Blood, treated with carbon monoxide, I found to assume a bright red, almost carmine, color, which did not alter on exposure to air for a number of days.

Finally, in February, 1888, a bottle of blood taken from the heart of one of the victims at the time of the autopsy, was submitted to me for examination. The bottle was closed with a tight cork. Although over a year old, and possessing strong odor of decomposition, the color still remained of the brilliant, vivid red noted at the time of taking the specimen. Under the microscope but very few corpuscles remained to be seen, their structure having almost completely broken down.

Examination by the spectroscope revealed the two absorption bands near the line, characteristic of the presence of carbon monoxide in combination. These bands, although very like those indicative of oxy-haemoglobin, may yet be readily distinguished by their location only, particularly if a sample of blood artificially treated with carbon monoxide be at hand for purposes of comparison.

The space between the bands is, moreover, much less clearly lighted than in the case of oxygenated blood. As a confirmatory test, the blood under examination was treated with solid potassium sulphide, and the absorption bands found unchanged thereby—the bands of oxy-haemoglobin, as is well known, change under such treatment to the single dark band midway between the positions of the former ones.

What is of special interest in this case is the ready detection of carbon monoxide in the blood after so long an interval of time.

At the present moment, nearly two years from the date of the accident, the blood still retains the characteristics noticed when first examined.

The analysis of the Fuel Gas by volume is :

CO_2	5.0	per cent.
O	0.5	"
CO	37.5	"
CH_4	.9	"
H	48.0	"
N	7.1	"

Such gas supplied to consumers is practically odorless.

WILLLIAM P. MASON.

RENSSELAER POLYTECHNIC INSTITUTE.
December 1, 1888.

METHOD OF DETERMINING INDIGOTINE FOR COMMERCIAL PURPOSES.

By F. A. OWEN. (Communicated by A. H. SABIN.)

Shave from the sample two or three grms. fine enough so that 1 grm. can be weighed with exactness ; place this 1 grm. on a watch glass and dry at 100° C. When dry, transfer it to a glass mortar and grind as fine as possible dry, then add water and grind to a very thin paste, which is then washed into a 250 c.c. flask. To this add 3 grms. zinc dust and about 6 grms. NaOH, and fill a little above the mark, as the volume diminishes, in an hour or two. The reduction takes place in half an hour to two hours ; the flask should be shaken occasionally and when the solution has become green the reduction is complete. If allowed to go too far reddish or brownish streaks appear, which indicate a loss of indigotine. Hydrogen is not given off until the reduction is completed, and froth indicates too much zinc. When the reduction is complete, draw off 50 c.c. of the clear liquor, let it stand exposed to the air half an hour, acidify with HCl, filter through a carefully washed filter, dry at 100° C. and weigh. It is not necessary to take any special care to prevent absortion of moisture in the balance pan. Indigo often loses 20 per cent. in drying, and dry indigo is of good quality if it yields 60 to 62½ per cent., but samples are met with yielding 80 per cent. after drying. The results of this method are in agreement with those obtained in a lime and copperas vat under good management.

ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

Incompleteness of Combustion in Gaseous Explosions. H. B. Dixon and H. W. Smith.

When a mixture of hydrogen and oxygen, in the proportions in which they combine to form water, was exploded in a leaden tube 100 metres long and 9 m. m. in diameter, there remained an explosive residue. Even with a slight excess of oxygen the hydrogen was not completely burned. From investigation, it appears that although the amount of surface exposed to the gases, has some influence on the amount unburnt, the influence is not very great, and that the incompleteness of the combustion is therefore not due to the cooling action of the surface of the vessel.

The capacity of the above mentioned lead tube was 8100 c. c. and the volume of unconsumed gas varied from 100 c. c. to 250 c. c. Nearly one per cent. of the original detonating gas remained unburnt. (*Chem. News.*, **59**, *65.*) W. P. M.

Coloration of a Coal Fire by Common Salt. Norman Leonard.

The blue flame produced, so different from the well-known sodium flame coloration, has been considered as perhaps due to a union of chlorine with the carbon and hydrogen of the fuel, with formation of compounds such as chloroform and tetrachloride of carbon. This supposition is pretty well borne out by the following facts:

1. The blue flame is not produced when sodium chloride is projected on to a red-hot platinum capsule.

2. The coloration is produced equally well by potassium chloride, and less readily by the chlorides of barium, calcium and ammonium.

3. The coloration is not produced by sodium carbonate, phosphate or sulphate.

4. Chloroform, carbon tetrachloride and ethylene dichloride, when thrown into a coal fire, produce blue colorations similar to that produced by sodium chloride. (*Chem. News*, **59**, *15*).

W. P. M.

ANALYTICAL CHEMISTRY.

Decomposition of Nickel and Cobalt.

The *Chemical News* publishes the following portion of a letter from Proff. Krüss:

"I have in fact succeeded in splitting up nickel and cobalt, each into two parts, and both these metals have one component in common. In concert with my colleague, I sent a brief notice on this subject to the *Berichte*, which will appear in Berlin on Monday next, 21st inst. The matter communicated in this short memoir has been intentionally kept very scanty, and I have given as little room as possible to speculation for fear of being led to assertions which I might perhaps soon have to withdraw. Meantime, I have fully confirmed our first observations, and we have now about ten different methods by which we can resolve these bodies, hitherto regarded as elementary, each into two parts. We shall soon give a full report on our results, but in the meantime I may inform you, as a curious fact, that we have succeeded in obtainin *green* so-called nickel salts from *red* cobalt salts and the *colorless* salts of the substance which accompanies both metals, and further, in transforming some green nickel salts into red cobalt salts and other components.

"This may perhaps sound alchemical, but it cannot be denied. As for the spectra of the three components of cobalt and nickel, we have not as yet, with the ordinary experimental arrangements, observed any characteristic lines. This is doubtless the reason why hitherto no spectral lines have been found common to pure cobalt and nickel." (*Chem. News*, **59**, *39*.) M. P. M.

Analytical Examination of Water for Technical Purposes. A. H. Allen.

Determination of hardness by titration with soap solution is utterly misleading. Although acting more slowly than CaO, still MgO does not possess greater hardening power; a statement contrary to Wanklyn, who claims that the hardening power of CaO is to that of MgO is as 2 is to 3. If by "hardness" of water is meant its soap destroying power, then no dilution of hard waters should be made previous to addition of the soap solution, inas-

much as the water is not diluted when used; on the other hand, if "hardness" represents the calcium and magnesium compounds present in the water, the soap test is too crude for use. For determination of "magnesian hardness" Wanklyn suggests the addition of ammonium oxalate powder, filtration and subsequent titration of the filtrate with standard soap solution. The author finds that such procedure does not answer, as the presence of the ammonium salt (other salts of the alkalies acting in a similar manner) has a most marked effect upon the result, the indicated hardness of a magnesian water to which an oxalate has been added, being found to vary with the amount of oxalate employed. The author holds that the day of Clark's soap test has gone by, and that chemists should turn to more accurate methods. Concerning the combination of basic and acid radicals the author believes that magnesium chloride should appear in the analysis to the full extent corresponding to the chlorine and magnesium present, on account of the tendency of magnesium chloride to decompose, on evaporating its solution, with formation of free HCl. Waters containing much $MgCl_2$ corrode the boiler at the water line. The addition of NH_4Cl will prevent the decomposition referred to, and, from experience with sea water, NaCl appears to act the same way. All the calcium, over and above that required to form carbonate, should be expressed as $CaSO_4$, on account of the prominence that should be given to the tendency of the water to form boiler scale. (*J. Soc. Chem. Ind.*, **7**, 795.) W. P. M.

Estimation of Caustic Alkali in Presence of Alkaline Carbonates. LEONARD DOBBIN.

The method is a kind of inverted "Nessler" test. A solution is prepared of the double potassium and mercury iodide, and a known amount of ammonium chloride is added. Alkaline carbonates give no reaction with this reagent, but a caustic alkali, when added in sufficient quantity to break up all the NH_4Cl. present will give the usual "Nessler" coloration. The ready solubility of the well-known brown precipitate in a solution of NH_4Cl, prevents any formation of color before the whole of the NH_4Cl. has been broken up into free ammonia. With a

standard solution such as the above, and also a standard solution of caustic alkali, the process for quantitative purposes is apparent. For use as a quantitative test for caustic alkali the reagent may be quickly made by taking a small quantity of $HgCl_2$ solution, adding solution of KI until red precipitate just redissolves and then adding a drop of NH_4Cl solution. (*J. Soc. Chem. Ind.* **7**, *829.*)

W. P. M.

New Test for Tannic Acid. S. G. Rawson.

Ammonium chloride mixed with ammonia, produces in solutions of tannic acid a white precipitate which rapidly becomes reddish brown on exposure to the air. With gallic acid no precipitate falls but the liquid becomes red. In working with dilute solutions of tannic acid it is better to add the ammonia mixture slowly, so that it may float on top. The white precipitate may then be easily seen at the line of separation of the two liquids. (*Chem. News*, **59**, *52.*) W. P. M.

Estimation of Glycerine in Soaps, Leys and Concentrated Glycerine. Otto Hehner.

A valuable paper not suitable for abstraction. (*J. Soc. Chem. Ind.*, **8**, *4.*) W. P. M.

Testing of Lard for Cotton Seed Oil and Beef Stearine. John Pattison.

Forty drops of the melted lard are placed in a test tube and dissolved in 10 c. c. ether. Two c. c. alcoholic solution $AgNO_3$ (1 of the salt to 100 alcohol) are added. The tube and its contents are left to stand five or six hours away from the light. If present, cotton seed oil will reduce the silver and imparts a maroon color to the solution. By comparing the depths of color with those produced by lards containing known amounts of cotton seed oil, the quantity present in the sample is estimated.

When searching for beef stearine, prepare an ethereal solution of the lard as above, plug the tube loosely with cotton wool and allow crystals to form by spontaneous evaporation. Under the

microscope the beef stearine crystals form curved tufts somewhat of the shape of the short tail of a horse, with terminals pointed and hair-like. Lard crystals are usually found in oblong plates, occasionally radiated, and have oblique terminals. (*J. Soc. Chem. Ind.*, **8**, *30.*) W. P. M.

INDUSTRIAL CHEMISTRY.

A New Alkali Process. W. W. STAVELEY.

Referring to the many attempts that have been made to decompose $Na_2 SO_4$, by means of slaked lime, the author states that it occurred to him that, probably at the moment of formation of Na HO, a reverse action takes place, and that if some body were present which could combine with the Na HO at the moment of formation, better results could be obtained. Upon agitating a mixture of $Na_2 SO_4$ solution and slaked lime and gradually adding cresol thereto, an almost complete decomposition of the sulphate into sodium cresylate was obtained with a precipitation of $Ca SO_4$. The sodium cresylate remaining in solution may be readily decomposed by means of CO_2 (fuel or limekiln gases) forming $Na_2 CO_3$ in solution and liberating the cresol, which will float on the surface as an oily liquid, and may be again employed for another lot of $Na_2 SO_4$. The paper is a full one and gives some figures as to cost, compared with other processes. (*J. Soc. Chem. Ind.*, **7**, *807.*) W. P. M.

Natural Aperient Bitter Waters. OTTO HEHNER.

It is doubtful if it be generally known by the medical profession that these waters, coming usually from very shallow wells fluctuate in strength almost from day to day. By varying the method of collection, two samples of very different strengths may be taken at the same time, as the stronger water tend to collect at the bottom of the well. In the same brand of water, bought at different times in the London market, the author found the following amount of $Mg SO_4$:

1st sample	215.85	parts per 10000.
2d "	304.80	" " "

(*Analyst*, **14**, *36.*) W. P. M.

Wool and Fur; their Origin, Structure, Chemical and Physical Composition—Composition and Modes of Cleaning them for the Textile Industry. WATSON SMITH.

A very full, interesting and abundantly illustrated paper, containing special reference to the use of volatile liquids (such as CS_2) for the purpose of scouring, in place of the soaps and alkalies more commonly employed. (*J. Soc. Chem. Ind.*, **8**, *17*.) W. P. M.

A New Process for Obtaining Ammonium Chloride from the Nitrogen of Coal, Coke, Cinders and Organic Matter generally. ANDREW FRENCH.

When nitrogenous organic matter is burned with a limited supply of air, in presence of sulphurous acid, steam and common salt, the author believes reaction takes place according to the following equation:

$$2NaCl + H_2So_3 + 3H_2O + C + N_2 = 2NH_4Cl + Na_2So_4 + CO_2.$$

The presence of NH_4Cl about the mouths of coal mines, where fires have started, may be thus explained, the waters of collieries frequently containing notable quantities of salt. Laboratory experiments were made with coal, coal cinders, shales, sewage sludge cake, seaweed, etc., in every case NH_4Cl was obtained. The author does not consider the process as yet developed to a manufacturing stage, but believes that it will be ultimately one of the important sources of ammonia. (*J. Soc. Chem. Ind.*, **7**, *735*.)

W. P. M.